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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,982	03/17/2004	Joon-Sung Kim	8054-44 (AW8105US/JY)	3068
22150	7590	11/16/2004	EXAMINER	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			SOUW, BERNARD E	
			ART UNIT	PAPER NUMBER
			2881	

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/802,982

Applicant(s)

KIM ET AL.

Examiner

Bernard E Souw

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), (10-2003-0016479), filed 09/18/2002 in Korea, which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-11 and 13-20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Lischke et al. (USPAT 4,677,296).

Lischke et al. disclose a method for measuring dimensions of minute structures, as recited in the Abstract/lines1-2, the method comprising the steps of: irradiating primary electrons PE shown in Fig.1 onto the minute structures P, shown in more details in Fig.2), as recited in Col.4/ll.12-14 and 54-60; providing image data of the minute structures shown in Fig.3 by detecting secondary electrons SE generated from the minute structures P, as recited in Col.4/ll.60-62; determining at least two measuring regions over the minute structures using the image data, as recited in Col.4/ll.62-68 and Col.5/ll.1-11+25-32+39-63; and calculating dimensions of the minute structures

measuring regions corresponding to the measuring regions, as recited in Col.5/ll.22-25+49-63.

► The above recited steps of Lischke's method clearly anticipate the present claims 1, 4, 6-9, 13 and 16-20, with more details as follows:

- Specifically regarding claims 6 and 15, the step of providing the image data by converting the secondary electrons SE into current signals is inherent in Lischke's, as implicated in Col.4/ll.26-30.
- Specifically regarding claims 7, 16, 17 and 20, the step of determining the measuring regions by mapping a movable boundary along an X-axis and a Y-axis with the image on the monitor, and transmits the coordinate values of the measuring regions to the operation member (claim 16); the step of calculating the dimensions of the minute structures, correlating the image data to the measuring region, and transmitting the data to the monitor display and the storage member R (claim 17), are all inherent in Lischke's, as recited in Col.5/ll.33-63.
- Specifically regarding claim 8, the step of correlating the image data to the measuring regions is inherent in Lischke's, as implicated in Col.8/ll.4-8.
- Specifically regarding claims 9 and 13, Lischke's method makes use of an electron emission member, i.e., the electron source E shown in Fig.1; a display member (not shown in figure drawing) that displays an SEM image shown Fig.2, formed by detecting secondary electrons from the minute structures on P of Fig.1, as recited in Col.4/ll.51-58 and col.8/ll.4-8, the display member determining at least two measuring regions over the minute structures of Fig.2, as inherently implicated in Col.5/ll.5-11; a

storage member R as part of signal processing system, as recited in Col.5/II.7-11; and an operation member for calculating dimensions of the minute structures and transmits the data to the display member, as recited in Col.5/II.22-25+49-63.

- Claims 18 and 19 recite the same limitations as claim 1, which has been previously rejected.

- ▶ Regarding claims 2 and 10, the limitation that the minute structures comprise a line, a hole, a trench, or a space, or a combination thereof, formed on semiconductor substrate P, is inherent in Lischke's, as shown in Fig.2 & 4 and recited in Col.4/II.49-68 and Col.5/II.1-63.

- ▶ Regarding claims 3 and 11, the step of synchronizing the primary electrons to scan the minute structure P is inherent in all scanning electron microscopes (SEMs), as recited in Col.4/II.58-61 and Col.5/II.41-47.

- ▶ Regarding claim 5, the step of storing the image data in a storage member is recited in Col.4/II.54-58, Col.5/II.7-11, whereas the storage member R is specifically recited in Col.5/II.7-9.

- ▶ Regarding claim 14, Lischke's image processing device R is for generating the image data on a monitor (not shown in Lischke's figure drawings), as recited in Col.4/II.51-58, Col.5/II.7-11 and Col.8/II.4-8, whereas Lischke's controller for determining the measuring regions is connected to the operation member, as implicated in Col.5/II.7-63, more specifically in Col.5/II.22-25+39-49.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lischke et al. in view of Vahala et al. (USPAT 4,929,041) or Wagner et al. (USPAT 5,659,172).

Lischke et al. show all the limitations of claim 12, as previously applied to claims 1 and 9 in combination, further including an electron gun E shown in Fig.1; a magnetic lens (part of the objective lens O) for focusing the primary electrons, as recited in Col.4/ll.24-26; a scanning coil A for synchronizing the primary electrons, as recited in Col.4/ll.14-24; a (second) electron detector for detecting secondary electrons SE, as recited in Col.4/ll.26-31.

However, Lischke et al. do not teach to use a (first) electron detector for detecting primary electrons that have been scattered from the minute structure. The use of such a detector is taught by Vahala et al. as recited in Col.2/ll.1-6, or, in the alternative, by Wagner et al. in Col.4/ll.35-38.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add to Lischke's method and/or apparatus a separate detector for detecting primary electrons that have been scattered from the minute structure, as taught by Vahala et al. or Wagner et al., in order to generate an image which is

sensitive to variations in the material composition of the surface, as suggested by Vahala et al. in Col.2/II.1-6.

#### ***Relevant Prior Arts***

4. These prior arts made of record and not relied upon are considered pertinent to applicant's disclosure: (a) USPAT # 5,523,568, issued on 06/04/1996 to Ichikawa et al., (b) USPAT # 4,933,565, issued on 06/12/2990 to Yamaguchi et al., and (c) USPAT # 5,659,174, issued on 08/19/1997 to Kaneoka et al., disclose the same subject matter as the present disclosure; they are therefore clearly anticipating the same claims under 35 U.S.C. § 102(b). Similarly, prior art references (d) USPAT # 6,753,518, issued to Watanabe et al. on 06/22/2004, and (e) US-PGPUB # 2004/0217287, also issued to Watanabe et al. on 06/22/2004, disclose the same subject matter. As such, they, too, are clearly anticipating the same claims under 35 U.S.C. § 102(a) and 102(e).

#### ***Communications***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The central fax phone

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number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes  
November 12, 2004

  
JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800